NONASSOCIATIVE PRODUCTS IN NONASSOCIATIVE ALGEBRAS WITH INVOLUTION

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ABSTRACT. Starting from the variety of associative, Lie, Jordan, alternative or Malcev algebras with involution, we classify all the formal bilinear products of the form

$$axy + bx^*y + cxy^* + dx^*y^* + Ayx + Byx^* + Cy^*x + Dy^*x^*$$

formed with the help of the original product and the involution $*$, which are either flexible, power-associative, alternative, associative, Jordan, binary-Lie, Malcev or Lie for all algebras of the chosen variety. To do so we formally define and study the change of product in an algebra acted on by a group of automorphisms and antiautomorphisms, solve the associative variety case via free algebras with computer assistance, and then solve the nonassociative cases via representations, nonassociative PI theory, and specific algebras.

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